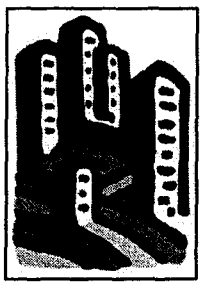
URBAN AGRICULTURE, PROGRESS AND PROSPECT: 1975-2005

by
Jac Smit
The Urban Agriculture Network (TUAN)
March 1996



Cities Feeding People Series
Report 18

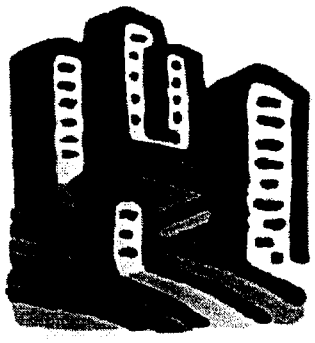
This Report has been edited from a background paper, commissioned by IDRC to The Urban Agriculture Network based in Washington, D.C. It was presented at The Third Meeting of the Support Group on Urban Agriculture (SGUA), hosted by IDRC in Ottawa on 17-19 March 1996. The proceedings of this meeting are published separately, in Cities Feeding People Report no. 17.

For additional copies, or for further information about this document, please contact:

Luc J.A. Mougeot or BrendaLee Wilson
Cities Feeding People
IDRC
PO Box 8500, Ottawa, Canada K1G 3H9

Telephone: (613) 236-6163 extension 2310 or 2475

Edited and prepared by: BrendaLee Wilson, IDRC, July 1996



Cities Feeding People Programme Reports

Initiative Agriculture urbaine Rapports de recherche

1. Urban Agriculture Research in East & Central Africa: Record, Capacities and Opportunities *by Camillus J. Sawio, University of Dar es Salaam (1993).*

2. Urban Agriculture Research in East Africa: Record, Capacities and Opportunities *by Davinder Lamba, Mazingira Institute (1993).*

3. Urban Agriculture Research in East & Southern Africa I: Record, Capacities and Opportunities *by Kadmiel H. Wekwete, University of Zimbabwe (1993).*

4. Urban Agriculture Research in East & Southern Africa II: Record, Capacities and Opportunities *by Admos Chimbowu and Davison Gumbo, ENDA-Zimbabwe (1993).*

5. Urban Agriculture Research in West Africa: Record, Capacities and Opportunities *by Souleymane Diallo, ENDA-Tiers Monde (1993).*

6. Urban Agriculture Research in East & Southeast Asia: Record, Capacities and Opportunities *by Yue-man Yeung, The Chinese University of Hong Kong (1993).*

7. Urban Agriculture Research in Latin America: Record, Capacities and Opportunities *by Julio Prudencio Bohrt, UNITAS (1993).*

8. Urban Food Production: Evolution, Official Support, and Significance *by Luc J.A. Mougeot, International Development Research Centre (1994).*

9. Promoting Urban Agriculture: Strategy Framework for Planners in North America, Europe, and Asia *by Paul Sommers and Jac Smit, The Urban Agriculture Network (1994).*

10. Urban Agriculture and the Sustainable Dar-es-Salaam Project, Tanzania *by Camillus Sawio, UNCHS-IDRC Project Coordinator (1994).*

International Development Research Centre (IDRC), Canada
Centre de recherches pour le développement international (CRDI), Canada

11. Une historie de deux villes: Canadian Community Gardening in Montreal and Toronto *by Sean Cosgrove, Toronto Food Policy Council (1994).*

12. Urban Agriculture: Can Planners Make a Difference? *by Timothy Greenhow, SWEDEPLAN/Swedish National Board of Housing, Building and Planning (1994).*

13. Agricultura urbana en América latina: evaluación in situ para iniciativa regional *por Julio Prudencio Bohrt, consultor del CIID (1994).*

14. L'agriculture urbaine en Afrique tropicale: évaluation in situ pour initiative régionale *par Kando Golhor, consultant du CRDI (1995).*

15. Cities Feeding People Project Fact Sheets *by Pascale Dennery, International Development Research Centre (1995).*

16. Urban Agriculture in Canada: A Survey of Municipal Initiatives in Canada and Abroad *by Michel Frojmovic, IDRC Consultant (1996).*

17. The Third Meeting of the Support Group on Urban Agriculture (SGUA): Proceedings, 18-19 March 1996, IDRC, Ottawa, Canada *by IDRC (1996).*

18. Urban Agriculture, Progress and Prospect: 1975-2005 *by Jac Smit, The Urban Agriculture Network (TUAN) (1996).*

19. Urban Agriculture: a Survey of Academic Expertise and Programs in Canada *by Rita Lindayati, IDRC Intern (1996).*

Copies can be obtained free of charge by writing to BrendaLee Wilson, Cities Feeding People Series, Programs Branch, IDRC, PO Box 8500, Ottawa, Ontario, K1G 3H9 Canada or by e-mail to BLWilson@idrc.ca
Visit our new internet website:
http://www.idrc.ca/cfp

Pour obtenir gratuitement les rapports ci-haut, prière de s'adresser à BrendaLee Wilson, Initiative Agriculture urbaine, Direction générale des programmes, CRDI, BP 8500, Ottawa, Ontario, K1G 3H9 Canada ou par courrier électronique: BLWilson@idrc.ca
Pour nous rejoindre sur l'Internet
http://www.idrc.ca/cfp

TABLE OF CONTENTS

URBAN AGRICULTURE
PROGRESS AND PROSPECT: 1975-2005

I INTRODUCTION

For the past fifteen to twenty years urban agriculture (UA) has been expanding globally, more rapidly than urban populations, and in many countries more rapidly than their economies. This paper takes a brief look at this historic phenomenon and looks ahead to the year 2000 for the significance of a continuance of this trend, and possible changes in the trend.

Policy shapers and those who make decisions about towns and cities are asking questions: Is urban agriculture a sign of progress or retrogression? Does it promote a healthy city or cause disease? Who are the urban farmers? Are they a part of the instability in cities, or are they contributing to the stability of the social and economic structure? How do towns and cities go about regulating and/or promoting urban agriculture? Is urban agriculture good or bad for the agriculture industry in my country?

From Africa, Latin America, Asia and Eastern Europe we have been receiving reports since the mid-1980s of the accelerating growth of urban farming. In Mozambique, the 1980 census found that close to one in three urban workers held jobs in agriculture. In Cuba, after the change in relationship with the Soviet Union, urban agriculture -- in a country that has an 80 percent urban population -- spread from factory site, to roadside, to homesite and the planned greenbelts around towns and cities. In Bangladesh a new program is producing livestock and fish food in urban sewage-fed ponds. In Sao Paulo, Brazil, the 1990s metropolitan master plan includes agriculture as a major planned land use. On the other side of the globe, Moscow reports that the share of resident families engaged in food production increased from 20 percent in 1970 to 65 percent in 1990.

Urban agriculture is increasing in newly independent countries, and in countries that have young capitalistic economies. It has expanded as well under socialist economies. Poland reported a doubling from 1975 to 1985. It is doing well in rapidly urbanizing countries and in countries that are ecologically limited, by shortages of water or arable soil, for example. Thus, it is important in dry Tunisia and mountainous Nepal.

The world's wealthiest nations, as well as the poorest, are sharing in the global trend to an increasing share of the agriculture pie going to urban farmers. From 1980 to 1990 urban agriculture grew by 17 percent in the USA. In that decade in Japan, the number of families participating in CSAs (Consumer Supported Agriculture) increased from five million to eight million. Urban families cooperating in this way with typically suburban farmers grew even more rapidly in Switzerland. In the Randstadt megapolis of Holland, an ever increasing number of farms have been converted from rural to urban production methods, as the city spreads in

narrowly defined corridors. In Dubai, on the Persian Gulf, a wealthy Prince captures the city's sewage in a million-cubic-meter tank and produces fresh fish for hotels and gourmet shops.

Youth in South-central Los Angeles, the South Bronx in New York City, Cabrini Greens in central Chicago and in many smaller cities in the US are taking up agriculture as enterprise. In New England 19th century textile mills are being converted into mushroom caves, fish tanks and hydroponic green houses. In old England the steel mills of Sheffield are generating jobs and fresh vegetables that compete in the market with imports from warmer climates.

In summary, what is going on in an urbanizing world in the final quarter of the 20th century, is the reversal of a 100-year trend that separated farming and human settlements, since the arrival of both the modern industrial city and modern industrial agriculture in the 19th century. It has a different appearance in Kuwait and Kinshasa, Zaire, but it shares more similarities than differences.

The argument can be made that city and regional policy can either be shaped around regulating urban agriculture or regulating and promoting urban agriculture. The options of doing nothing or stamping it out, are not viable. Doing nothing is risky as health crises can be caused by unregulated farming in the city. Doing nothing can benefit those who need government support the least, and hurt those who most need the benefits of urban agriculture, the poor. Attempts to stamp it out or accelerate its demise have failed on a hundred fronts, best documented perhaps in southern Africa (Zimbabwe). Attempts to stamp it out promote poor practice, inefficiency, less desirable crops, and generate *opportunities lost.*

A policy of benign regulation can reap tremendous benefits. In Harare, sanctions were lifted temporarily in 1992. Within two years, the area cultivated had doubled and the number of farmers more than doubled. Municipal costs for landscape maintenance and waste management were down, food prices were down, and hundreds of jobs had been created. Several benefits were gained from only a change in policy, not new positive government programs. Similar policy-related benefits are documented in Lusaka and Accra, in the 1970s.

It is possible, based on studies in 30 countries and perusal of hundreds of documents, to come to some fairly reliable forecasts, if half or more of our assumptions about continuing trends are not overturned (see Table 2).

We may expect that the number of urban farmers producing for the market will double from about 200 million in the early 1990s to 400 million by 2005. This would include an increase in urban production from one-third to one-half of all vegetables, meat, fish, and dairy products consumed in the city.

II DEVELOPMENT COOPERATION, 1975 to 1995

The 1970s

There was very little international reporting or attention to urban agriculture until the late 1970s. More documentation was produced in the 1980s.

The best reported, and perhaps the most outstanding of the urban agriculture development programs of the 1970s, was Operation Feed Yourselves (OFY) in Ghana. Having said that, it also needs to be mentioned that somewhat similar programs, with more or less success, were going on in Zaire, Côte d'Ivoire and other West African countries, with French Government and FAO support.

OFY began with the premise that much of Ghana's food imports could be grown within the country, particularly in cities and near factories. The objectives were import substitution, self-sufficiency in maize, rice, livestock, fish, poultry and vegetables. The government determined what could be produced, and what inputs were necessary, and then assisted families, associations, and businesses in acquiring the means of production. It promoted the formation of farmers' associations in and near settlements.

The results of both the technological changes and the organizational changes can still be found in Ghana. From 1970 to 1974 (the program continued to 1976) production of plantain increased from 200,000 acres to 849,000, okra from 18,000 to 47,000 and rice from 136,000 to 2,265,000 acres. Vegetable production, given an emphasis in urbanizing areas, increased between three and four times.

In central Africa, there was a major example of development cooperation in urban agriculture carried out in Lusaka, Zambia. It began with AFSC (American Friends Service Committee) assisting some squatters on the urban fringe to raise vegetables and small livestock to feed their family and friends. The success of the project attracted UNICEF, who expanded the project and added school gardens and training. At that time, in the mid-1970s, the World Bank arrived on the scene with a major squatter area upgrading project. The AFSC/UNICEF urban agriculture project was folded into the WB project, and rain-fed farms at the edge of the city were added to the smaller irrigated farms near homes.

Small-Scale Horticulture in a Squatter Area of Lusaka, Zambia

Residents of a squatter settlement near the sewage lagoons in Lusaka, farm the area in and around the squatter settlement to produce some food for consumption. The production is small-scale and informal, using low-quality inputs collected from the market or neighboring areas, and undertaken on public land. Although it is legal to use public land for cultivation in Zambia, using sewage for irrigation is not sanctioned. In this case, however, the effluent from lagoons has been biologically treated in a passive lagoon.

The farmers produce vegetables such as squash and beans for family consumption. One farmer has expanded his farming activity to produce cash crops such as sugar cane for toddy and bananas, from which he earns a good income. He has shaped fields by hand and uses crop rotation. He composts neighborhood waste for his fields and uses effluent from the sewage lagoon for irrigation.

Source: Urban Agriculture Network Case File.
Contact: Harrington Jere, Human Settlements of Zambia, Lusaka

A most significant element in this story is the policy shift of the Lusaka local corporation, which went from banning agriculture to regulating and encouraging it, according to UNICEF data and policy dialogue. Since then, several academic studies have been done on UA in Lusaka, including a PhD dissertation.

The most typical development cooperation activities of the 1970s were home or household gardens, and school and community gardens. Save the Children, FAO and other international aid organizations supported household and community gardens with the prime objective of improving the family diet. In some cases, participants were removed from the program if they were caught selling any of the farm product.

No quick overview can do justice to this massive global effort, which continues to the present day. In the early days, the concept was partially to spread the European pattern of backyard and allotment gardens. In later years, it became more influenced by home garden practice in developing countries, for instance Indonesia and the Philippines. In these places, the

typical farming system was more complex and included more benefits than is generally achieved in Europe.

Unfortunately, many if not most household and community garden projects were evaluated to be a failure, and the intervention lost support. This purported failure also damaged the reputation of urban agriculture, although there was neither any intervention in other systems or methods of urban agriculture, nor any evaluation of its costs and benefits.

It would not be unfair to say that in the 1970s most development professionals considered:

1. rural to urban migration to be an ephemeral phenomenon,
2. that urban agriculture was attributable to the short-term incidence of rural farmers migrating to the city, and
3. doing something that was inappropriate in the long term.

The 1980s

It is reasonable to say that the urban agriculture development cooperation of the 1980s will be remembered for the research done by the "Food-Energy Nexus" project of the United Nations University. This study commissioned papers from many regions -- Europe, Latin America, Africa, Asia -- and many countries reported on the status of food and energy production within and near towns and cities. In five years, it published 24 UA papers, co-published nine more and archived nine unpublished papers on urban agriculture. The final report was published in 1992.

For the first time, in one related body of reports, urban agriculture was exposed as a global phenomenon, thriving in diverse economies, climates, and cultures. Unexpected data were reported: cities that were more than 100 percent self-sufficient in production of vegetables and small livestock and exporting to other cities and rural places; cities where the majority of the resident families were engaged in raising food; cities where 60 percent and more of the land space was in agricultural land use; and, perhaps most surprising, evidence that urban agriculture was increasing not decreasing in the 1980s. The reports point to two sociological findings: 1) that the urban farmers were not the recent in-migrants but long-term residents, and 2) that they were not only the poor, but included all income categories.

In the 1980s, IDRC was engaged in studies of the use of urban waste as an input to urban agriculture, urban food distribution systems, and urban food security and sponsored some 30 studies in 24 countries.

At the same time UNICEF carried out a global study with Urban Resources Systems on community and household gardens. SIDA and other development agencies were, in the 1980s, supporting farmers' cooperatives in the Zonas Verdes in Maputo and other Mozambican cities. SIDA also supported urban agriculture extension services in Lesotho and Botswana.

Several local NGOs and community organizations were active in supporting urban farming: Human Settlements in Zambia, Undungu Society in Kenya, SODEM and CET in Chile, and the Urban Food Foundation in the Philippines.

In the Western Hemisphere, the Interamerican Foundation (IAF) was funding urban agriculture production, research, and training in Chile, and contributed to world-class models. In Peru, Oxfam and others were supporting women's community gardens. This effort has expanded to producing for community kitchens, for market, and a national program supported by the national and local governments (HUFACAM). Lately, it has done outstanding work in hydroponics and guinea pig rearing (REDE).

The rapidly spreading "popular hydroponics" movement in Latin America -- in at least eight countries -- began with an early 1980s UNDP-funded project in the Ciudad Bolivar section of Bogota, which houses about one million squatters. It is now being supported by FAO and several other development cooperation organizations.

Backyard Gardeners Use Biointensive Methods in Maipú, Chile

Farmers in a low-income settlement in Maipú, Chile, grow a mix of vegetables, herbs, fruits, and microlivestock on small household plots ranging from 10 to 40 square meters. Farming began about ten years ago through the initiative of SODEM, a Maipú-based community development organization, with training provided by CET, a national technical NGO advancing alternative agriculture. Several international agencies, including CODEL, GTZ, and Lutheran World Relief provided support.

The farmers collect garbage from neighboring residences and compost it for farming input. For most families, farming is a second economic activity; they produce primarily for consumption

by family and friends, but a few produce for sale in the market. Some female farmers grow culinary herbs at home and sell them in the local market.

The original purpose of the project was to improve the food security and nutritional status of residents of low-income neighborhoods. But gradually, farmers expanded their activities: they have planted street trees to improve the neighborhood environment and for collective marketing of fruit. The farmers are now well established; they have created a city park with farming plots as well as recreational space.

This model of local and national NGO cooperation to promote urban farming is eminently replicable in other countries and cities.

Source: Urban Agriculture Network Case File.
Contact: Camila Montecino, CET, Colina, Chile

One of the more visionary projects in urban agriculture was the "Street Food" project supported by USAID. This study in Africa, Asia and Latin America opened our eyes to the prevalence and relevance of informal marketing of raw and processed, locally-produced food products. Again, what had been perceived to be *marginal and ephemeral* was defined as *significant and permanent.* In Bogor, Indonesia one of fifteen jobs in the city was found to be in Street Food, not counting the related jobs in agricultural production. FAO, IDRC and USAID have been active in street food studies for more than ten years.

In the 1980s, GTZ became active in the field of urban waste and its use in urban agriculture. The World Bank also supported composting projects and in some cases related it to urban food production.

In the middle of the decade, a benchmark study was carried out by the Mazingira Institute in Kenya with IDRC support. Following the UNU lead, it measured food and fuel production and it included a range of settlements, from small to large, in different climactic and cultural zones. This seven-volume study statistically put to rest several myths about urban agriculture: two-thirds of all urban Kenyan households were found to be farmers -- 63 percent in Nairobi. The poorest of the poor and the new urban in-migrants were never found to be farmers. Only one-quarter of the Kenyan urban farmers was farming their own land. Fully one quarter found that the food they produced was absolutely essential to their physical survival. More than two thirds of the Kenyan urban farmers were women.

The 1990s

Development cooperation in urban agriculture began the 1990s with the UNDP "Urban Agriculture Initiative." The idea behind this study was for one expert -- with a support team -- to visit six countries in each of Asia, Africa and Latin America, and report on "What's so," and therefore "What's to be done." This study has resulted in the book *"Urban Agriculture: Food, Jobs and Sustainable Cities,"* which is currently being distributed worldwide. The eighteen countries visited intentionally included some that had previously been reported on, such as the Philippines, Kenya and Chile, but also countries not in the literature. This was a work of discovery, not data collection. In four years, the following has been achieved: the first comprehensive book on urban agriculture; the urban agriculture network of more than 3,000 members in 40 countries; and the formation of the SGUA (Support Group for Urban Agriculture). This group is the child of the UNDP's Urban Agriculture Advisory Committee (UAAC) formed in 1991.

The original work of the UNDP UA initiative has been carried forward with support from IDRC, UNICEF, WB, GTZ, CARE and others, to include reports on 25 countries. At the same time, as these numerous field trips were being made, data was being collected on an equal number of other countries from literature and through participation in several conferences and workshops, (India, Indonesia, Bolivia, Mexico, South Africa, Brazil, Germany, Canada, UK, USA) and visits with experts at UN University, Urban Resource Systems (USA), AVRDC, Taiwan, FAO, GTZ, Mazingira Institute, the University of the Philippines, CET (Chile), Xochimillco (Mexico), Rodale USA, NRI (UK), ETC Foundation (Netherlands) and several others. This body of information is the foundation of several masters and doctoral papers, and many projects.

IDRC built upon its work in Kenya by commissioning a study of six cities of all sizes in Tanzania and has supported 25 studies on many aspects of urban agriculture, from wastewater management in Vietnam to dairying in West Africa. It has supported workshops in Bolivia, India, and Canada, and hosted the Third Meeting of the SGUA (see IDRC's Cities Feeding People Report 17). In 1994, UNICEF commissioned feasibility studies of urban agriculture projects for women and children in Colombia, Eritrea and Côte d'Ivoire. It has also included urban agriculture in its *"Primary Environmental Care"* strategy.

Examples of CARE's work in urban agriculture are two urban agriculture projects in Haiti on inner city slums and peri-urban market production. AVRDC (Asian Vegetable Research and Development Centre) is supporting urban agriculture in South East Asia (Vietnam), Central America (Costa Rica) and East Africa (Tanzania). The government of Taiwan is supporting urban agriculture in Panama, amongst other places. JICA has a long history of supporting urban agriculture, beginning in Brazil, and including Africa and Asia.

The Natural Resources Institute (NRI) in UK has been concentrating its urban agriculture work in Africa and currently is managing a global research effort into peri-urban production. It has an applied project underway in Tanzania, and studies in Ghana and Nigeria. The World Bank has published an urban agriculture study of Sub-saharan Africa *Urban Agriculture: An Opportunity for Environmentally Sustainable Development in Sub-Saharan Africa,* AFTES, March 1996. The Bank has recently funded a workshop in Calcutta, and its EDI/EN division is currently designing a policy training program.

The German technical assistance agency (GTZ) has a large vegetable production project underway in Tanzania and is supporting studies in such related areas as waste management and forestry. FAO has recently published a volume on urban forestry and will be including an article on urban farming in their forthcoming annual publication, *State of Food and Agriculture.*

Italy is supporting the *Pro-Huerta* project in Argentina. This project has had a remarkable growth curve -- from 1990 to 1994 it has grown from 40,000 to 550,000 participants and from 100 to 1,100 civic partners. These 1,100 partners may be comparable to the 14,500 organizations belonging to Germany's community gardening association representing two million participants.

National Support for Small-Scale Urban Farmers: Pro-Huerta, Argentina

Argentina is one of the few countries to create an integrated national-level agency to promote urban agriculture in the 1990s. INTA (Instituto Nacional de Tecnologia Agropecuria), SAGP (Secretaria de Agricultura, Ganadaria y Pesca), PFS (Programa Federal de Solidaridad), and SDS (Secretaria de Desarrollo Social) together formed Pro-Huerta in 1990 with Italian bilateral aid.

Pro-Huerta lists more than 500,000 beneficiaries in 1994 (up from 43,000 in 1991). These half-million Argentineans are supported at 62,000 community, school, and institutional "huertas" producing vegetables, fruit, and small livestock (particularly rabbits). Pro-Huerta reaches these small-scale and home farmers through 1,100 cooperating institutions in 1,800 towns and cities through its thirteen regional offices.

The objectives of the program are to improve nutrition and food security, promote small-scale in-town production, and advance community participation in solving food-related problems. Its action programs include training trainers; enrolling institutions; providing inputs

such as seeds, seedlings and, livestock; and technical assistance in sustainable methods, including organic production.

Sources: Pro-Huerta Brochure, 1994; Urban Agriculture Network Case File.

USAID has been supporting a project in Russia (St. Petersburg) that is not only feeding the poor, but has reached inside of the prison system. France (CORAF), in concert with FAO and WB, is supporting a regional study of vegetable production for cities in West Africa.

The African Development Bank is supporting at least ten urban agriculture projects from Addis Ababa to Maputo, and from fuel to fish. The Asian Development Bank is funding urban agriculture projects in several countries on seaweed, fish and shrimp, mushrooms, and horticulture.

A pioneering program at UNCHS (Habitat) is called "Sustainable Cities" (SCP). The first project in the program - the Sustainable Dar es Salaam Project - has included urban agriculture with participation of IDRC, NRI and GTZ. It is considering including urban agriculture in its projects in Accra and Madras.

The 1990s finds development support for urban agriculture to be small, but widespread and growing, while most international aid is shrinking.

Publications, Degrees and Workshops:

The 1990s have been remarkable not only in the number of international cooperation agencies engaged in UA, but also in the number of publications, conferences/workshops and university degrees earned on the subject.

A quick look at the Inter University Library list under 'Urban Agriculture' and 'Urban Farming' in March 1996 found 71 titles, all published in the 1970s, 1980s and early 1990s:

	Number of titles
1970s	4
1980s	34
1990s (five years)	33

The distribution of these titles by country indicates interest and capacity, but also the size of the national publishing industry:

	Number of titles
USA	19
JAPAN	18
EUROPE *	10
AFRICA (all East)	9
UK	8
CANADA	3
ARGENTINA	2
ASIA **	2

* Spain 3, France 2, Italy 2, Germany 1, Russia 1, Netherlands 1; ** China 1, Bangladesh 1

Clearly, from the viewpoint of university libraries, Japan leads the world in urban agriculture scholarship, followed by East Africa. All but one of the books published in Japan are about urban agriculture in that country, whereas the USA publications are mostly about countries in the South. China, the world's leader in urban agriculture on the soil, is not recognizing it as a field of research. Only two books are from the former socialist countries (Russia and China). The most significant fact by far is that the 1980s exceeded the 1970s by a factor of eight and that the 1990s were experiencing double the number of publications than the 1980s from 1990 through 1994.

Actual publications and unpublished articles make up a far larger collection than the library listings. A large percentage of these are in the library of the Urban Agriculture Network, but there are many more that are not documented in one single place.

In the 1970s and 1980s, an article would be published occasionally in geography, city planning, agriculture or anthropological periodicals. There were more in Japan than in Europe or North America, and fewer still in developing countries. In the 1990s, the phenomenon began of entire issues of periodicals being devoted to urban agriculture including: *"Habitat International," "Hunger Notes," "African Urban Quarterly," "ILEIA Newsletter," "Intermediate Technology Journal," "IDRC Reports," "International Ag-Sieve,"* and *"Urban Perspectives."*

Whereas in the 1970s and 1980s articles were limited to specialized magazines and newsletters, in the 1990s articles began appearing in general interest periodicals such as: *"The World Paper," "In-Context," "Choices," "Journal of the American Planning Association," "New Renaissance"* and *"Environment and Urbanization," "Scientific American,"* and *"New Scientist."*

Significantly, in 1995 IDRC began publishing a series of documents under the title "Cities Feeding People" with 18 titles published to date.

With more in recognition of UA through projects and publications, an increase in degree candidates and degrees granted was predictable. The first undergraduate degree program is slated to begin in Pretoria, South Africa (The Technikon) in 1996/97. Previously, degrees had been at the masters and doctorate level at schools such as the University of London, University of California at Berkeley, MIT, Clark University, and the University of British Colombia.

In the early 1990s, conferences and workshops on UA are exploding. In the decade of the 1980s there were only half-a-dozen workshops, if one includes those organized around household gardens. In 1996 we have already learned of workshops in Indonesia, Zimbabwe, Mexico, and Germany.

From 1991 to 1995, each regional workshop increased in the number of participants, organizations and countries attending: Jakarta, Ottawa, York UK, London, Dar es Salaam, Johannesburg, Leipzig, La Paz, Havana, Calcutta. Sadly, only three of these workshops have had their proceedings published to date.

Many conferences in the 1990s are including panels on urban agriculture: Manchester Global Forum, 1994, World Future Society, 1996, UNCED Global Summit, 1992, and Habitat II, 1996.

III POLICY

At the time of the so-called cultural revolution in China in the 1960s, a policy and program was established to achieve nutritional self-reliance for all administrative districts, including urban districts. District boundaries and administrative structures were organized to this end. Land use, waste management, food marketing, credit and agricultural input plans and programs were established, and to this day China's large and small cities are among the most efficient in food production.

Two items of recent data are worthy of note regarding China's pro-urban agriculture policy: 1) urban poultry and pork production are increasing by double digits per year in response to changing food demand and increasing family incomes, and 2) infant mortality and other childhood health indicators are better for Chinese cities than for most other developing countries, and some developed countries.

We have mentioned the fact above, and the impact of the policy shift of the OFY program in Ghana and the AFSC project in Lusaka. Singapore today has policy and regulation firmly favoring urban agriculture, as does Hong Kong. In the 1970s, for a time Singapore removed swine raising from the permitted urban uses. In the 1980s, it was reinstated and today Singapore is self-reliant in pork.

Curitiba, Brazil, began policy and program initiatives in the 1970s to make use of idle land for food and fuel production, using urban waste. It is now frequently cited as a bellwether for environmental planning and development. Sao Paulo in the 1990s learned from Curitiba (some of the same planners), and included urban agriculture in its new policy plan.

Urban Agriculture in Singapore

The land-use management of the island nation of Singapore is one of the most effective anywhere. For instance, it has a world-leading public housing system, and it manages its downtown traffic very skillfully. The superior urban management is reflected in its very successful urban agriculture system, which uses both ancient technology and advanced modern techniques adapted to its multiracial society. Singapore farms between the high rises and in its suburbs, and it farms the surrounding seas.

The Primary Production Department of the Ministry of Agriculture is responsible for applied research, extension, training, and supplies for nutritional self-reliance in the island nation. Most of the farmers it caters to, run small operations and have been in business, on average, more than ten years. Singapore has both three-year and ten-year lease agreements with farmers, depending upon the type of crop and the abutting land uses. Rents are related to production, not land value. Among the other innovations is fish-horticulture mixed farming.

Singapore citizens consume much meat (70 kilograms per capita per annum), and Singapore is fully self-reliant in meat. Singapore also produces 25 percent of the vegetables it consumes. On about 7,000 hectares, Singapore licenses about 10,000 farmers in fish, livestock, and horticulture. However, many householders are unlicensed small-scale producers.

The Primary Production Department has planned, to an exceptional degree, to recycle wastes into green areas, concentrating on livestock production, vegetable raising, and fish farming. Organic wastes feed both land and sea crops, including seaweed and shrimp. Starting in 1974, mushrooms began to be grown on multistory stacking shelves using composts from agricultural wastes, such as banana leaves and straw.

Sources: Linda Agerbak, "Agricultural Innovation in the City-State," Asia 2000 (n.d.), pp. 28-29; and Dr. Leong Poo Chow, Annual Report, Agriculture Ministry, Primary Production Division, Singapore (1985).

Mozambique was faced with a civil war at the dawn of independence. An early decision of the socialist government was to invite peoples' cooperatives to transform the cities' open spaces into farms. The results are now known worldwide. A third or more of the nutritional requirements of towns and cities were produced in the urban areas, and that percentage is significantly higher for protein and micro-nutrients. The policy has been continued after the war and is supported by ADB and other international development cooperation agencies.

In 1989, Russia withdrew its support from Cuba, particularly for food and agriculture. Cuba, with an 80 percent urban population, turned around its policy 180 degrees to encourage urban agriculture. In 1995, Cuba hosted a week-long regional urban agriculture conference. Today in Cuba a would-be urban farmer can gain access to land and water through the national association of women. Inputs are available through State supported AgStores in many neighborhoods. And, women can sell their products at street markets which were closed for 30 years.

neighborhoods. And, women can sell their products at street markets which were closed for 30 years.

Policy is also changing in Europe and North America. The States of Massachusetts and New Jersey (90 percent urban population) promote locally grown products. In North America, the cities of Toronto, Chattanooga, Hartford, and many others, have food policy councils which promote local nutritional self-reliance. Seattle has included a farm at the core of each of its communities that restructure the city in its long term plan.

In Europe, the Milan, Hamburg and Freiberg local authorities are well known for pro-urban agriculture policies and programs. In the United Kingdom, ten or more cities are supporting city farms.

While, cities and countries are changing their urban agriculture policies, international development cooperation agencies are lagging behind. However, there are a few bright spots on the horizon. In 1994, the UNDP hosted the *World Mayors Colloquium.* The mayors listed urban agriculture, along with reducing unemployment, as a first step of six in coping with their food insecurity and environmental degradation problems.

Table 1 clearly indicates that promoting urban agriculture requires national action to provide the 'infrastructure' for action by municipalities and communities. A small percentage of the world's community of nations is actively supporting it in 1996. Communities and municipalities are promoting UA on their own, but without the desirable muscle. Global programs are today principally supporting community action; to be fully effective, global support is needed at the national and municipal level, as well. This table can be viewed as a clarion call for a Global Urban Agriculture Funding Facility.

Table 1. Community, City, National, and Global Policy Roles in Urban Agriculture

	Community	City	Nation	Global
Survey, document	*	*	*	*
Access to land	*	*	*	
Integration with education	*	*	*	*
Extension and credit services	*	*	*	*
Establish partnerships	*	*	*	*
Food security targets	*	*		
Integrate with waste management	*	*		
Support the disadvantaged	*	*		
Environmental sustainability	*	*	*	*
Adopt policy		*	*	
Information services		*	*	*
Regulation		*	*	
Worker and public safety		*	*	
Enabling legislation			*	
Research			*	*
Tax relief, subsidy		*	*	
Model codes/standards			*	*
Enable public authorities			*	
Global and regional cooperation			*	*

In late 1994, in Vienna, Austria, the CARE International governing council voted to include urban agriculture in its relief and development strategy. In 1996, in Copenhagen, they moved the policy up to program status.

In 1995, IDRC enhanced the status of its 'Cities Feeding People' project activities to that of a programme and increased its funding at a time of decreased overall budget. At the same time, FAO formed an informal interdepartmental working group on urban agriculture and decided to include a major article on the subject in its next annual report (SOFA). In the UK, the ODA established a special fund for peri-urban agriculture studies and projects. In Sweden, SIDA has drafted a statement to the Global Summit "Habitat II" which includes urban agriculture. In 1996, the German technical development agency, GTZ, is forming an interdepartmental working group on urban agriculture. And last, but perhaps not least, both the House of Representatives and the Senate of the United States have passed, and funded, the *"Community Food Security Act"* which will encourage and support urban community nutritional self-reliance.

There is a scattered but discernible trend for policy to shift toward favoring urban agriculture in the poorest and richest countries, but still far less than merited by the scale of the activity.

IV PROSPECT 1996-2005

It is reasonable to estimate that urban areas in 1995 produced between 15 and 20 percent of the world's food. We know, for instance, that in the United States between 35 and 40 percent of its agricultural products, in money value of marketed crops, are grown in its statistical metropolitan areas, and that locally-produced vegetables, fruit and poultry, from more than 15 million small-scale producers, do not go through these markets. We also know that urban agriculture is more common in many countries than it is in the United States. Chile, China, Kenya, and Poland are examples.

We can anticipate that with a continuing trend toward increased urban food production, in ten years time 25 to 30 percent of the world's food will be produced in its rapidly growing urban areas. By the time the world is half urban, cities may well be 50 percent reliant on urban produced food.

At least four factors will contribute to this transformation of the agriculture industry:

1. Cities are expanding at lower densities than ever before and more land is available for farming for each additional person residing in the world's towns and cities;

2. Urban agriculture is becoming relatively more efficient and competitive with rural agriculture in certain crop lines including vegetables, aquatic crops, poultry and pork;

3. Urban agriculture is becoming more popular in the South for its food security, jobs and environmental benefits, and in the North because it produces a better product;

4. Increasing civil unrest (future Bosnias and Somalias) and urban poverty will continue to build the demand for interim urban agriculture programmes.

During the next decade, urban agriculture will be accepted and implemented as a major intervention in food security and social security programs. This trend is foreshadowed by programs in Peru (REDE), Mozambique, Cuba, Italy, China, Japan and the United States.

During the next decade, environmental agencies and programs will increasingly include urban agriculture. This will occur because urban agriculture is an affordable environmental program. It pays for itself. An urban greening program, using trees and grass, saves costs on air conditioning and earns income if fuelwood and wood products are produced. However, these programs are costly in terms of landscape maintenance. Urban agriculture programs return the

same benefits and, in addition, provide food, generate more jobs, support businesses, and maintain the landscape.

Table 2.
2005 URBAN AGRICULTURE
FORECAST / SCENARIO

	1990	2005
Share of World food produced	1/7 - 1/5	1/4 - 1/3
Share of vegetables, meat, fish, dairy consumed in cities	1/3	1/2
No. of urban farmers (for market)	200 million	400 million

Assumptions

- Urbanization continues apace, see IIED, 1996 data
- Lower density cities increase opportunities for farming;
- PC and Internet enable improved communication and decentralized marketing;
- Technology transfer increases yields, improving competition with rural agriculture;
- Late 19th century waste handling technology is replaced with decentralized biological processing of waste;
- "Waste is Food" concept accepted by global agencies and many nations;
- "Food Security" is accepted as basic to social security and shelter by UNCHS, UN/FAO and most nations;
- Virtual corporations and civic-public partnerships continue to thrive;
- Women's businesses continue to grow faster than men's businesses;
- Democratization continues to open up markets, credit, means of production, and access to resources;
- City planning and management join with the environmental and civic movements to promote healthy and green cities:

NB: Not all assumptions need to be satisfied to produce forecast.

The next decade will witness a continuation and wider spread of the dramatic improvement of urban agriculture technology. In the past decade, the most remarkable advances have been in aquaculture and hydroponics. As the agricultural scientists focus on plant and animal crops appropriate to urban situations, increases in yields will occur. We may expect that the recent revolution in shrimp culture will spread to other aquatic crops, and that the revolution in hydroponics will spread to other small-scale production methods.

The research of the 1980s and early 1990s in the more efficient use of urban waste as a natural resource will, in the second half of this decade, begin to have more common application. Massive sewerage and landfill projects will be recognized as archaic, and modern home and community-based waste management systems will become more common. The latter will in turn provide the ecological base for increased urban food production even in the now polluted urban core communities. Forerunners of this renaissance can be found in Bogota, Beijing, Calcutta, Edmonton (Agriplex) and Dakar.

The organizational structure of urban agriculture is changing and will in the next few years change more rapidly and more widely. The most dramatic change is the *"Virtual Corporation."* This organizational option enables small producers and processors to market their products efficiently with the benefit of prompt reliable technical and market information, and access to credit. Virtual corporations are allowing the small grower to enter the market.

A case in point is the Jerusalem Hydroponic Vegetable Cooperative. This organization has a nine-member board of directors (six producers and three marketing experts). All producers are self-employed and sell their product on a firm weekly schedule, which they have designed, to a known sales outlet. Another example is the Urban Food Foundation in Manila, where 500 small producers own a meat processing and marketing facility which sells directly to retail outlets. With the virtual corporation there is no need for large farms or for layers of middlemen in the urban agriculture industry.

Community and city civic organizations (NGOs) will increasingly support urban agriculture in the next decade. Until the 1990s, their support was largely limited to household and community gardens. In the 1990s, they are recognizing the larger benefits available by supporting a greater variety of urban agriculture modalities.

Women, in many but not all parts of the world, are adopting urban agriculture as "cosa nostra." Women's organizations are producing, processing and marketing urban agriculture-based produce. As women inexorably achieve greater legal and financial rights, urban agriculture will grow apace.

The most important trend in urban agriculture is an acceleration of public-private partnerships. At the grass roots, farmers' associations and CBOs are establishing relationships with NGOs, universities and the business community. NGOs in turn are establishing relationships with local civic organizations, research facilities, and local and national governments. The global trend is to less intrusive national governments and more partnerships with civic organizations. Urban agriculture benefits from this trend, as national extension programs, with few exceptions, have not reached the urban farmer.

National and local urban agriculture organizations are coming together in regional partnerships -- Latin America, Asia, Africa -- and relating to bilateral and global development and agricultural organizations. Urban agriculture is a complex activity that thrives when diverse partnerships are functioning.

Food markets in many of the world's poorest and richest countries, and those in between, are carrying an increasing share of products grown/raised in urban areas. This trend may continue for the next ten years and beyond. In the global food market, so-called "back-of-the-port" production (air or sea) is growing. Flowers are the leading items, with vegetables following close behind.

Informal food markets are becoming more formal, and formal and informal markets are becoming one. Cuba is a case in point, where the informal markets of the 1950s have been reinstituted and formalized. Nicaragua also has formalized its informal markets. In Nairobi, the Asian Foundation has established a formal hawkers market. Street food is being regularized in many cities and countries, some with the assistance of FAO and WHO (*Healthy Markets Program)*. All of these small changes make urban agriculture more than ever competitive with rural agriculture in some product lines.

The benefits of positive programs are recorded on many slates. Perhaps the most dramatic is the transformation of urban waste into food. Many local governments and development agencies have supported urban waste management to promote fish, livestock and vegetable production. These programs are actively being supported by UNCDF (UN Capital Development Fund), GTZ, NRI, DGIS, IDRC and other development cooperation agencies.

The science of modern city planning and management was born in Europe 150 years ago. Following the lead of China, Japan, and Brazil, it is just beginning to recognize agriculture as an urban economic activity and land use. The recognition is due to recent environmental and ecological awareness, the global issue of unemployment and the growth of urban hunger in the South. Whereas throughout most of the 1980s agriculture was perceived as marginal and ephemeral in the city, during the next decade it will be recognized and included in policy and

program for its food, jobs and environmental benefits. The challenge is to get effective policy and program tools into the hands of the planners and managers on time.

APPENDICES:

The following tables are from the 1996 UNDP/TUAN Monograph *Urban Agriculture: Food, Jobs and Sustainable Cities.*

Appendix 1

Urban Agriculture -- Global Estimates

World Population Actively Engaged	800 million
Farmers Producing for Market in the World	200 million
Jobs* in World in Production and Processing	150 million

	Preponderant range of data	Global general significance
Participants:	15% to 70% of families (share of urban families)	about one third of urban families
Production:	10% to 90% of consumption (vegetables, eggs, meat/fish)	about one third of consumption
Land Use:	20% to 60% of urban area (land in agricultural use)	over one third of urban regions

Source: Estimates by The Urban Agriculture Network based on the authors' experiences and observations and on extrapolations from statistics from various official censuses and professional surveys. The intent is to present a thumbnail sketch of the significance of the industry. More systematic estimation would be a major contribution to the body of knowledge.

* Actual employment, not job equivalents

Table 1. Global estimates of the level of urban agricultural activity (based on 1993 data)

Appendix 2

Organization	Location	Project Description
Urban Food Foundation	Philippines	Instrumental in forming a coop of 500 small livestock producers
SODEM	Chile	Uses model gardens to Train home gardeners. Provides extension help
Undugu	Kenya	Supports urban farming for food security, enterprise, disaster mgmt
CET	Chile	Training and extension to low-income for biointensive gdng.
Peru Mujer	Peru	Training and organizing community gardens for low-income women
Grupo de Estudios Ambientales	Mexico	Provides technical advice to Chinampas farmers
Kinshasa farmers' cooperative	Zaire	Facilitates access to inputs, land, and markets
Indonesia national agronomists association	Indonesia	Provides information and lobbies the government

Table 2. Local support organizations active in urban agriculture (some examples)

Appendix 3

Organization	Location	Project Description
Mexico City Water Authority	Mexico City	Provides irrigation and oversight of peri-urban farming
Calcutta Port Auth.	Calcutta	Leases land and lagoons to coops
Maputo Municipality	Mozambique	Land-owning partner with women's food production coop
Indonesia Hwy. Auth.	Indonesia	Leases ROW land to urban farmers
Jakarta Water Auth.	Jakarta	Formed joint venture with fishermen to harvest reservoirs.
Elec. Authorities	Canada	Produces vegetables in greenhouse
Municipality	Munich	Produces fish in sewage lagoons
Municipalities	Jakarta, Mexico City, Buenos Aires	Have an urban agriculture agency
US military	USA	Leases land on bases to farmers
Nat'l Government	Argentina and Peru	Established national agencies for urban agriculture
Nat'l Government	Panama, Tanzania and Zambia	Have recently adopted policies that favor urban agriculture
Nat'l Government	Italy, China, Japan, Singapore, Netherlands	Implemented urban agriculture policy and established agencies for decades
Nat'l Government	Malawi and Tanzania	New capitals planned to include urban agriculture

Table 3. Governmental organizations active in urban agriculture (some examples)

Appendix 4

Organization	Location	Project Description
Sokoine U.	Morogoro, Tanzania	Two-year survey of six cities
AIT	Bangkok, Thailand	Pilot projects in intensive ag. techniques
U. of Philippines	Los Baños	Research on small-scale farming
Centre pour le Dev't de l'Hort.	Sénégal	Research and extension on urban horticulture
AVRDC	Taiwan	Urban horticulture and household gardens research and extension in East Asia and Africa
CIPES	Peru	Wastewater aquaculture and horticulture
CANELO	Chile	Nine research projects in urban farming technologies
Mazingira Inst.	Kenya	Survey of UA in six cities
Univ. of Cairo	Egypt	Plastic tunnel horticulture
Centro Las Gaviotas	Colombia	Hydroponics for low-income high-density communities
Makerere Univ.	Uganda	Research and surveys on UA
Botanical Garden	Jakarta	Research on composting with small-scale urban farmers

Table 4. Universities and other institutions involved in research on urban agriculture (some examples)

Appendix 5

Organization	Location	Project Description
FAO & IDRC	Latin America	Supporting new regional network
FAO	Several	Supported street food upgrading projects
UNDP and FAO	Latin America	Supported shantytown hydroponics projects
UNDP/WB	Global	Programs in wastewater-fed fish and irrigation
UNICEF	Global	Household and community gardens, policy studies
United Nations University	Global	Funded Food-Energy Nexus Program (1980s)
UN/CHS	Tanzania	Supporting UA as environmental intervention in open space
NRI/ODA, UK	Tanzania	City centre and peri-urban vegetable production & training
IDRC (Canada)	Global	Funds urban agriculture surveys and research projects
USAID (USA)	Philippines & Thailand	Supported urban agriculture in its MEREC program (1980s)

Table 5. International agencies supporting urban agriculture (some examples)

Organization	Location	Project Description
GTZ (Germany)	Mexico City & Tanzania	Supports sewage-fed fisheries, composting, and veget. projects
Italian Government	Argentina	Supports community gardens
SIDA (Sweden)	Mozambique & Ethiopia	Provided support for urban agriculture in the 1980's
JICA (Japan)	Philippines and others	Supports urban agriculture and marketing
Taiwan Government	Panama	Supports urban agriculture and provides fellowships in Taiwan
Inter-American Foundation	Chile	Supports urban gardening programs
Ford Foundation	Nairobi	Supports an NGO, Undugu Soc.
Oxfam	Peru	Supports an NGO, Peru Mujer
Save the Children	Central America	Support for local gardening
CARE International	Haiti	Promoting UA entrepreneurship

Table 5. (Cont.) International agencies supporting urban agriculture (some examples)